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OSHA MEDICAL SURVEILLANCE REQUIREMENTS AND NIOSH RECOMMENDATIONS

For Employees Exposed to Toxic Substances
and Other Work Hazards

ORIGINAL

COMPLETED

Prepared by

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for

The NASA Occupational Health Office
National Aeronautics and Space Administration
Washington, D.C. 20546

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The National Institute for Occupational Safety and Health (NIOSH) is pleased to provide you with this report. As you will note, this report was prepared by BioTechnology for the National Aeronautics and Space Administration (NASA). This report was approved for distribution by Biotechnology. Permission was also given by NASA's Occupational Health Office. This report summarizes OSHA Medical Surveillance Requirements of the Occupational Safety and Health Act as set forth in General Industry Standards, 29 CFR 1910.1000 and recommendations taken from NIOSH criteria documents. Specific relevant sources for this summary are shown in the first column accompanying each chemical name.

National Institute for Occupational
Safety and Health
4676 Columbia Parkway
Cincinnati, Ohio 45226

ORIGINAL

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR REC- OMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHER- WISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
2-Acetylaminofluorene (1910.1014, 11/78)	1. Physical exam, with attention (attn) to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
Acetylene (NIOSH 76-195, 7/76)	1. Medical and work histories. 2. Physical exam.	Not specified 1. Same as in A.	In an emergency 1. Proper medical care.
Acrylamide (NIOSH 77-112, 10/76)	1. Medical and work histories, with attn to: a. Weight loss; b. Neurologic disturbances. 2. Complete physical exam, with attn to: a. Skin; b. Eyes; c. Nervous system. 3. Judgment of worker's ability to use positive or negative respirator.	Annually, or as DBRP 1. Interim medical and work histories. 2. Complete physical exam as in A.2.	Additional 1. If exposed, weekly exam of fingertips of hands and other parts, looking for skin peeling.
Acrylonitrile (1910.1045, 11/78)	1. Applies only to those exposed to acrylonitrile at or above the action level, w/o regard to use of respirators. 2. Work and medical histories, with attn to: a. Skin; b. Respiratory system;	Annually 1. Applies only to those exposed to acrylonitrile at or above the action level, w/o regard to use of respirators. 2. Same as in A.	In an emergency exposure situation 2. First aid and prompt medical attention. 3. Observation and follow-up for delayed neurological effects.
			Additional 1. For those developing signs/symptoms associated with exposure. 2. Appropriate examinations.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

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Acrylonitrile (continued)	c. Gastrointestinal system; d. CNS dysfunctions, such as headache, nausea, vomiting, dizziness, and weakness. 3. Complete physical exam, with attn to: a. Central and peripheral nervous system; b. Gastrointestinal system; c. Respiratory system; d. Skin; e. Thyroid; f. 14" x 17" post/ant chest X-ray; g. Further tests of the gastrointestinal tract, including fecal occult blood screening, for ≥ 40 yrs old and as DBRP.		
Alkanes (C5-C8) (NIOSH 78-116, 3/77)	1. Comprehensive medical and work histories, emphasizing conditions affecting: a. Peripheral and central nervous system; b. Skin. 2. Physical exam, with general tests of: a. Nervous system functions; b. Skin condition. 3. Ability to use positive and negative pressure respirators.	At least annually 1. Same as in A.	
Allyl chloride (NIOSH 76-204, 9/76)	1. Comprehensive medical and work histories, with attn to: a. Respiratory system; b. Liver; c. Kidneys; d. Skin; e. Eyes.	At least annually 1. Interim medical and work histories; 2. Liver function tests and urinalysis as described in A.3.	If overexposed, should have within reasonable length of time 1. Physical exam. 2. Urinalysis. 3. Liver function tests. 4. Pulmonary function tests.

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Allyl chloride (continued)	2. Physical exam. 3. Clinical tests: a. 14" x 17" chest X-ray; b. Pulmonary function (FVC, FEV1.0); c. Complete blood count; d. Complete urinalysis, with microscopic exam; e. Liver function tests (SGOT, SGPT determinations). 4. Ability to use negative or positive pressure respirator.		5. Other tests, as DBRP. 6. If in direct contact, consider eye and skin irritation during physical exam. In an emergency 7. Administration of first aid. 8. If eye contact or vapor inhalation, consult physician.
4-Aminodiphenyl (1910.1011, 11/78)	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
Ammonia (NIOSH 74-136, 7/74)	1. Comprehensive medical exam, with attn to: a. Eyes; b. Skin; c. Upper respiratory system. 2. Pulmonary function tests. 3. Ability to use negative or positive pressure respirator.	Not specified 1. Medical surveillance for: a. Eyes splashed with ammonia; b. Signs/symptoms of eye irritation after exposure; c. Signs/symptoms of respiratory tract irritation; d. Skin irritation.	

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Antimony (NIOSH 78-216, 9/78)	1. Comprehensive medical and work histories, emphasizing: a. Skin; b. Mucous membrane; c. Pulmonary system; d. Cardiac system. 2. Physical exam, with attn to: a. Skin; b. Mucous membrane; c. Pulmonary system; d. Cardiac system. 3. Clinical tests: a. 14" x 17" post/ant chest X-ray; b. ECG; c. Pulmonary function tests (FVC, FEV1.0). 4. Ability to use positive or negative pressure respirator.	At least annually 1. Interim medical and work histories. 2. Physical exam and tests as in A.2 and 3.	
Arsenic (inorganic) (1910.1018, 7/78)	1. Covered employees: a. Those who are or will be exposed to arsenic at or above action level, w/o regard to use of respirators, at least 30 days/yr; b. Those who have been exposed as in 1.a for ≥ 10 yrs. 2. Work and medical histories, including presence and degree of respiratory symptoms, such as shortness of breath, cough, sputum production, and wheezing. 3. Medical exam, including: a. 14" x 17" post/ant chest X-ray and International Office UICC/Cincinnati (ILO U/C) rating; b. Nasal exam; c. Skin exam; d. Sputum cytology exam; e. Other exams, as DBRP.	Annually 1. For covered employees < 45 yrs old with < 10 yrs exposure, w/o regard to use of respirators. 2. Same as in A.3. Semi-annually 3. For all other covered employees. 4. Same as in A.2 and 3.	At least 6 mos preceding termination of employment 1. Same as in A.2 and 3. Additional 2. For those developing signs/symptoms associated with exposure. 3. Appropriate examinations.

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Benzene (continued)	3. Family history: a. Blood dyscrasias, including hematologic neoplasms. 4. Personal history: a. Blood dyscrasias, including genetically-related hemoglobin alterations, bleeding abnormalities, abnormal function of formed blood elements; b. Renal dysfunctions; c. Liver dysfunctions; d. Drugs routinely taken; e. Alcohol intake; f. Systemic infections. 5. Lab tests: a. Complete blood count, with: i. Red cell count; ii. White cell count with differential; iii. Platelet count; iv. Hematocrit; v. Hemoglobin; vi. Red cell indices (MCV, MCH, MCHC); vii. Serum bilirubin; viii. Reticulocyte count. b. Additional tests, as DBRP. 6. No medical exam is required if the above (2-5) or exposures are OK.	4. Lab tests: a. Complete blood count as in A.5.a, except vii and viii; b. Additional tests, as DBRP. 5. Medical examination, as DBRP, if employee develops signs/symptoms associated with exposure.	
Benzidine (1910.1010, 11/78)	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent;	At least annually 1. Same as in A.	

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Beryllium (NIOSH 72-10268, 6/72)	1. Physical exam, with: a. 14" x 17" chest X-ray; b. Baseline pulmonary function (FVC, FEV1.0); c. Baseline weight.	Annually, except when variance has been granted based on minimal exposure 1. Spirometry, including FVC and FEV1.0. 2. Medical history questionnaire, including: a. Presence and degree of respiratory symptoms, i.e., breathlessness, cough, sputum production, and wheezing. 3. 14" x 17" chest X-ray.	
Boron trifluoride (NIOSH 77-122, 12/76)	1. Medical and work histories. 2. Physical exam, with attn to: a. Respiratory system; b. Pulmonary function (FVC, FEV1.0); c. 14" x 17" post/ant chest X-ray, as DBRP; d. Respiratory difficulties.	At least annually 1. Same as in A.	In an emergency 1. Immediate first aid, with emphasis on: a. Respiratory tract; b. Skin; c. Eyes. 2. Flush with water if skin or eye contact.
Cadmium (NIOSH 76-192, 8/76)	1. Comprehensive work and medical histories. 2. Physical exam, with: a. 14" x 17" post/ant chest X-ray; b. FVC and FEV1.0; c. Blood pressure; d. Blood analysis (urea nitrogen count, SGOT, and other liver enzymes); e. Urinalysis (microscopic exam, sugar determination, quantitative protein determination, specific gravity, urine cadmium levels). 3. Ability to use positive or negative pressure respirator.	Annually, or as DBRP 1. Medical and work histories. 2. Physical exam, with: a. Urinalysis (quantitative protein determination every 4 mos—check cadmium level to see if > 10 µg/l; b. FVC, FEV 1.0; c. BP; d. Chest X-ray, as DBRP; e. Blood analysis; f. Palpation of prostate in male workers > 40 yrs old.	

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Carbaryl (NIOSH 77-107, 9/76)	1. Medical and work histories, looking for: a. Frequent headaches, dizziness, tightness in chest, dimness of vision, difficulty in focusing eyes; b. Glaucoma; c. Cardiovascular disease; d. Hepatic diseases; e. Renal diseases; f. CNS diseases; g. Use of anticholinergic drugs; h. Pre-exposure: Determine baseline erythrocyte cholinesterase activity. 2. Physical exam, with attn to: a. Cardiovascular symptoms; b. Central nervous system; c. Vision; d. Kidneys; e. Complete urinalysis, including a microscopic exam.	Annually, or as DBRP 1. Medical and work interim histories as in A.1.a. 2. Physical exam as in A.2.	In an emergency 1. First aid (see Appendix III of Reference). If adverse health effects seen 2. Appropriate medical services.
Carbon black (NIOSH 78-204, 9/78)	1. Comprehensive medical and work histories, emphasizing: a. Respiratory system; b. Heart; c. Skin; d. Previous exposures to potential respiratory and skin irritants and pulmonary carcinogens; e. Smoking and tobacco histories. 2. Physical exam, with attn to: a. Upper and lower respiratory tract; b. Heart; c. Skin;	At least annually 1. Interim medical and work histories. 2. Physical exam as in A.2. 3. Clinical tests as in A.3, with the exception of the X-ray, which will be provided as follows: a. Annually if exposed to CB > 0.1% PAHs; b. Triennially if exposed to CB < 0.1% PAHs.	

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Carbon tetrachloride (NIOSH 76-133, 6/76)	- Medical and work histories, including: - Nausea, vomiting, visual disturbances; - Use of alcohol and barbiturates. - Medical exam, with attn to: - Kidneys; - Eyes (black, white, and color vision fields); - Liver function. - Use of a respirator.	Annually, or as DBRP Same as in A.	
Chlorine (NIOSH 76-170, 5/76)	- Medical and work histories, with attn to: - Cardiac disease; - Bronchitis; - Tuberculosis; - Pulmonary abscesses; - Chronic respiratory diseases. - Physical exam with olfactory deficiency tests. 14" x 17" post/ant chest X-ray. - Use of respirators.	Annually, or as DBRP Refer worker to physician if exposed to high concentration, or exhibits signs/symptoms of respiratory tract irritation.	Additional Refer worker to physician if exposed to high concentration, or exhibits signs/symptoms of respiratory tract irritation.
Chloroform (NIOSH 75-114, 12/74)	- Comprehensive medical and work histories, with attn to: - Gastrointestinal symptoms; - Mental status; - Alcohol consumption. - Physical exam, with attn to: - Cardiac rhythm; - Liver function; - Kidney function; - Urinalysis. - Ability to use negative or positive pressure respirator.	Annually, or as DBRP Same as in A.	

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bis-Chloromethyl ether (1910.1008, 11/78)	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking. 2. Personal, family, and occupational histories, with emphasis on: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
Chloroprene (NIOSH 77-210, 8/77)	1. Comprehensive medical and work histories, with attn to: a. Skin; b. Eyes; c. Central nervous system; d. Hepatic system; e. Pulmonary system; f. Renal system. 2. Physical exam, with attn to: a. Skin; b. Eyes; c. CNS function. 3. Clinical tests, at least: a. Urinalysis; b. 14" x 17" post/ant chest X-ray; c. Pulmonary function test (FVC, FEV1.0); d. Determination of SGPT; e. ECG; f. Others, as DBRP 4. Ability to use positive pressure respirator.	Annually, or as DBRP 1. Same as in A.1, 2, and 3.	In an emergency 1. First aid, especially with regard to: a. Eyes; b. Lungs.

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Chromic acid (NIOSH 73-11021, 7/73)	1. Work history: All exposures to chromic acid and other hexavalent chromium compounds. 2. Medical history, including: a. Skin sensitivity; b. Pulmonary sensitivity; c. Skin or mucous membrane condition, such as dermatitis, ulcers; d. Membrane of the upper respiratory tract for bleeding, irritation, ulceration, perforations. 3. Ability to use negative or positive pressure respirator. 4. 14" x 17" chest X-ray.	Annually 1. Same as in A.1 and 2. 2. 14" x 17" chest X-ray, >40 yrs old. Every 5 yrs 3. For those ≤40 yrs old. 4. 14" x 17" chest X-ray.	Additional 1. For those with signs/symptoms of skin or upper respiratory tract irritation. 2. Immediate medical examination.
Chromium (VI) (NIOSH 76-129, 12/75)	1. Includes maintenance personnel. 2. Comprehensive medical and work histories, including: a. Potential skin or pulmonary sensitivity; b. Skin or membranous condition; c. Smoking habit; d. History of kidney or liver disease. 3. Skin exam for evidence of: a. Dermatitis; b. Chrome ulcers. 4. Exam of upper respiratory tract membranes for irritation, bleeding, ulceration, perforation. 5. Ability to use negative or positive pressure respirator. 6. Urinalysis. 7. 14" x 17" chest X-ray.	Annually 1. Same as in A.	If adverse effects due to exposure seen 1. Remain under physician's care until recovery. Additional 2. For those developing signs/symptoms of upper respiratory tract irritation due to exposure. 3. Medical examination.

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Chromium (VI) (continued)	8. If considered necessary by responsible physician: a. Sputum cytology; b. Liver function studies.		
Coal gasification (NIOSH 78-191, 9/78)	1. Comprehensive medical and work histories, with special emphasis on pre-existing disorders of: a. Skin; b. Respiratory tract; c. Liver; d. Kidneys. 2. Physical exam, with attn to: a. Oral cavity; b. Skin; c. Respiratory system; d. 14" x 17" post/ant X-ray. 3. Pulmonary function tests, including: a. FVC, FEV1.0; b. Sputum cytology; c. Urinalysis; d. Urine cytology; e. ECG; f. Multiple serum chemistry, as DBRP; g. Audiometric exam, for those exposed to noise. 4. Ability to use positive pressure respirator.	Annually 1. Same as in A.1 and 3. Biennially 2. Same as in A.2.	On termination 1. Same as in B.

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Coal tar products (NIOSH 78-107, 9/77)	1. Comprehensive medical and work histories, with special emphasis on pre-existing disorders of: a. Skin; b. Respiratory tract; c. Liver; d. Kidneys. 2. Physical exam, with attn to: a. Oral cavity; b. Skin; c. Respiratory system, including: i. 35 cm x 42 cm post/ant and lateral chest X-ray; d. Pulmonary function tests (FVC, FEV1.0); e. Sputum cytology; f. Mucous membrane of the oral cavity; g. Liver function tests, as DBRP; h. Urinalysis, as DBRP. 3. Ability to use positive pressure respirator.	At least annually 1. Same as in A.1 and 2.	
Coke oven emissions (1910.1029, 5/78)	1. For those who will work in regulated areas at least 30 days/yr. 2. Work and medical histories, including: a. Smoking history; b. Presence and degree of respiratory symptoms (breathlessness, cough, sputum production, wheezing). 3. Physical exam: a. 14" x 17" post/ant chest X-ray and ILO U/C rating;	Annually 1. For those in regulated areas 30 days/yr. 2. Same as in A. Semi-annually 3. For those 45 yrs old or over, or with 5 or more yrs of employment in the area. 4. Same as in A, even when these employees are transferred to another area.	At least 6 mos preceding termination of employment 1. Same as in A.

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Coke oven emissions (continued)	b. Pulmonary function tests (FVC, FEV1.0, with recording of type of equipment used); c. Weight; d. Skin exam. 4. Lab tests: a. Urinalysis (for sugar, albumin, hematuria); b. Sputum cytology; c. Urine cytology.		
Cotton dust (1910.1043, 1/79)	1. Medical history. 2. Standardized questionnaire, which asks questions on: a. Work area; b. Cough; c. Phlegm; d. Chest illness; e. Tightness of chest; f. Breathlessness; g. Smoking; h. Work history; i. Allergies. 3. Pulmonary function (FVC, FEV1.0, and % deviation from standard).	Annually 1. Medical history. 2. Abbreviated work questionnaire. 3. Pulmonary function test as in A.3. Semi-annually 4. As DBRP according to pulmonary function tests.	
Cotton dust in cotton gins (1910.1046, 8/79)	1. Medical history. 2. Standardized questionnaire, which asks questions on: a. Work area; b. Cough;	Annually 1. Same as in A. 2. If FEV < 60% of predicted value, refer to physician for detailed pulmonary.	

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Crystalline silica (NIOSH 75-120, 11/74)	1. Medical and work history: a. Exposure to free silica; b. Signs/symptoms of respiratory disease. 2. 14" x 17" or 14" x 14" post/ant chest X-ray. 3. Baseline FVC and FEV1.0. 4. Ability to use negative or positive pressure respirator. 5. Body weight, height, and age.	At least every 3 yrs 1. Same as in A, except 3.	
1,2-Dibromo-3-chloropropane (1910.1044, 7/78)	1. Medical and work histories, including reproductive history. 2. Physical exam, including: a. Genitourinary tract, testical size, body habitus, including sperm count; b. Serum specimen: FSH, LH, total estrogen (for women), and others, as DBRP.	Annually 1. Same as in A.1 and 2. 2. Additional appropriate examinations, as DBRP.	In an emergency situation 1. Sperm count as soon as practicable, and 3 mos later. 2. If vasectomized, serum specimen as in A.2.b.
3,3-dichlorobenzidine (and its salts) (1910.1007, 11/78)	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	

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Dinitro-ortho-cresol (continued)	b. Complete blood count; c. Hematocrit; d. Liver function; e. Kidney function. 4. Ability to use positive and negative pressure respirators.		
Dioxane (NIOSH 77-226, 9/77)	1. Comprehensive medical and work histories, emphasizing disorders of: a. Upper respiratory system; b. Hepatic function; c. Renal function. 2. Physical exam, with attn to: a. Nares; b. Hepatic function; c. Renal function. 3. Clinical tests, at least: a. Liver function test, e.g., SGOT, SGPT; b. Kidney function test, e.g., complete urinalysis. 4. Ability to use positive pressure respirator.	Annually 1. Same as in A.1, 2, and 3.	
Emergency egress from elevated work stations (NIOSH 76-128, 1976)	1. Medical and work histories. 2. If work at <80 ft but >15 ft: a. Depth perception; b. Fields of vision; c. Reaction time; d. Manual dexterity; e. Coordination; f. Abnormal tendency toward dizziness.	Annually, or as DBRP 1. Same as in A.	

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Ethylene dibromide (NIOSH 77-221, 8/77)	1. Comprehensive medical and work histories, emphasizing disorders of: a. Heart; b. Liver; c. Kidneys; d. Central nervous system. 2. Comprehensive physical exam, emphasizing: a. Cardiovascular system; b. Pulmonary system; c. Neurologic system; d. Hepatic system; e. Renal system; f. Skin exam. 3. Ability to use negative or positive pressure respirator.	Annually, or as DBRP 1. Same as in A.	Additional 1. If suspected of exposure to EDB at or above action level or to liquid EDB. 2. Prompt medical care. 3. 48-hr observation period for delayed systemic or dermal effects.
Ethylene dichloride (NIOSH 76-139, 9/78)	1. Comprehensive medical and work histories, with special emphasis on: a. Respiratory system; b. Cardiovascular system; c. Hepatic function; d. Renal function. 2. Comprehensive physical exam. 3. Ability to use positive pressure respirator.	Annually 1. Same as in A.1 and 2.	
Ethyleneimine (1910.1012, 11/78)	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking.	Annually 1. Same as in A.	

WORK EXPOSURE (REFERENCE AND DATE)	A. PRE-PLACEMENT REQUIREMENT	B. PERIODIC REQUIREMENTS	C. OTHER REQUIREMENTS
BOLD TYPE FOR OSHA STANDARDS	FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ethyleneimine (continued)	2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.		
Ethylene oxide (NIOSH 77-200, 8/77)	1. Comprehensive medical and work histories, with special emphasis on symptoms in: a. Eyes; b. Blood; c. Lungs; d. Liver; e. Kidneys; f. Nervous system; g. Skin. 2. Comprehensive physical exam, with emphasis on: a. Pulmonary system; b. Neurologic system; c. Hepatic system; d. Renal system; e. Ophthalmologic system; f. Skin. 3. Complete blood count, including white cell count, differential count, hemoglobin, and hematocrit.	Annually, and more frequently, as DBRP 1. Same as in A.1 and 2.	
Fibrous glass (NIOSH 77-152, 4/77)	1. Comprehensive medical and work histories, with emphasis on: a. Acute or chronic skin condition; b. Pulmonary disease; c. Prior exposure to dusty occupation (silica, coal dust, asbestos).	At least annually, or as DBRP 1. Same as in A.1, 2, and 3.	

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Fibrous glass (continued)	2. Physical exam, with attn to: a. Skin; b. Respiratory system; c. Other tests for: i. Dermographism; ii. Pulmonary function (FVC, FEV1.0), as DBRP; iii. Eye exam, as DBRP. 3. If exposed to fibers $<3.5 \mu\text{m}$ at levels above action level: a. Chest X-ray; b. Pulmonary function tests (FEV1.0, FVC); c. Other tests related to detection of chronic lung diseases, including tuberculosis. 4. Ability to use positive and negative pressure respirators, and ability to function under partial oxygen deprivation.		
Fluorides (inorganic) (NIOSH 76-103, 6/75)	1. Medical exam, with emphasis on: a. Musculoskeletal; b. Pulmonary; c. Gastrointestinal; d. Kidneys; e. Moderate-to-severe osteosclerosis; f. Radiological exam of male pelvis, with gland shielding; g. Urinalysis (for fluoride levels). 2. Use of respirators.	Every 2 yrs 1. Same as in A, except for A.1.f. Every 6 yrs 2. Same as in A.1.f.	1. Biologic monitoring as specified in pp 3-4 of Reference. To be done every 3 mos on at least 1/4 all exposed workers.

WORK EXPOSURE (REFERENCE AND DATE)	A. PRE-PLACEMENT REQUIREMENT	B. PERIODIC REQUIREMENTS	C. OTHER REQUIREMENTS
BOLD TYPE FOR OSHA STANDARDS	FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fluorocarbon polymers (decomposition products of) (NIOSH 77-193, 9/77)	1. Comprehensive medical and work histories. 2. Physical exam, with attn to: a. Respiratory system. 3. Ability to use negative or positive pressure respirator.	As DBRP 1. Not specified.	
Formaldehyde (NIOSH 77-126, 12/76)	1. Comprehensive medical and work histories, with attn to: a. Chronic inflammatory reaction of the respiratory tract; b. Chronic inflammatory reaction of skin; c. Hypersensitivities or other allergies, e.g., asthma, hayfever, rose fever. 2. Ability to use positive or negative pressure respirator.	Not mentioned	Additional 1. In the event of overexposure. 2. Physical exam as in A.1 within a reasonable period of time.
Glycidyl ethers (NIOSH 78-166, 6/78)	1. Comprehensive medical and work histories, with attn to: a. Past exposure to glycidyl ethers or other vinyl derivatives; b. History of sensitivities, reproductive events. 2. Physical exam, with attn to: a. Skin; b. Eyes; c. Mucous membranes. 3. Clinical tests, as DBRP: a. Total and differential leukocyte counts; b. Urinalysis;	As DBRP 1. Same as in A.1, 2, and 3.	Additional 1. In the event of an illness suspected to be due to glycidyl ethers. 2. Physical exam as in A.2 and 3.

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Hydrogen cyanide and cyanide salts (NIOSH 77-108, 10/76)	1. Work and medical histories, with attn to: a. Skin disorders; b. Nonspecific symptoms such as headache, nausea, vomiting, dizziness, weakness. 2. Physical exam, with attn to: a. Skin; b. Thyroid; c. Cardiovascular system; d. Upper respiratory system. 3. Ability to use negative or positive pressure respirator.	Annually 1. Same as in A.1.	In an emergency 1. First aid.
Hydrogen fluoride (NIOSH 76-143, 3/76)	1. Work and medical histories: a. Exposure to hydrogen fluoride, inorganic fluoride; b. Respiratory diseases; c. Renal diseases. 2. Ability to use negative or positive pressure respirator. 3. Physical exam: a. Urinalysis: i. Pre-exposed fluoride concentration in urine; ii. Renal function; b. Skin and corneas for presence of scars; c. X-ray of pelvis of all male workers, with shielding of gonads; d. Renal diseases; e. Pulmonary function; f. Osteofluorosis.	Not specified 1. X-ray of male pelvis, as DBRP (or when average of preshift urinary fluoride concentration for preceding 6 yrs exceeds 4.0 mg F/l). 2. Same as in A.3.a and b.	Additional 1. As DBRP, if signs/symptoms of respiratory tract irritation present when examined by physician: a. Follow-up chest X-ray; b. Pulmonary function tests. 2. For eye complaints following exposure: a. Follow-up visual acuity tests; b. Ophthalmologic exam, as necessary. 3. For skin contact, prompt medical attn.

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Hydrogen sulfide (NIOSH 77-158, 5/77)	1. Comprehensive medical and work histories, with emphasis on: a. Eyes; b. Nervous system; c. Respiratory system. 2. Physical exam, with attn to: a. Eyes; b. Nervous system; c. Respiratory system. 3. Ability to use positive and negative pressure respirators, as DBRP.	Every 3 yrs for those exposed to HS above ceiling limit 1. Same as in A.1 and 2.	Additional 1. In event of illness known or suspected to be caused by exposure to HS. 2. Physical exam, as in A.2. In an emergency 3. First aid, with artificial respiration, if necessary. 4. Prompt transport to hospital, if unconscious.
Hydroquinone (NIOSH 78-155, 4/78)	1. Comprehensive work and medical histories, with emphasis on: a. Eye injury; b. Dermatitis; c. Gastrointestinal disturbances. 2. Physical exam, with attn to: a. Eyes; b. Skin. 3. Slit-lamp exam of eyes. 4. Ability to use positive pressure respirator.	Annually, or as DBRP 1. Interim work and medical histories. 2. Ophthalmic exam by trained individual with slit-lamp (biomicroscope) or better technique. If damage to the cornea is found, eyes should be examined by an ophthalmologist. 3. Physical exam as in A.2.	In an emergency 1. First aid and observation for delayed eye effects.
Isopropyl alcohol (NIOSH 76-142, 3/76)	1. Comprehensive medical and work histories. 2. Complete physical exam, with attn to: a. Skin; b. Sinuses; c. Respiratory system. 3. Ability to use negative or positive pressure respirator.	Annually 1. Same as in A.	Additional 1. For those with adverse effects due to exposure. 2. Appropriate health care.

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Ketone (NIOSH 78-173, 10/78)	1. Comprehensive medical and work histories: a. Pre-existing neuropathy; b. Disorders of: i. Nervous system; ii. Respiratory system; iii. Eyes. 2. Physical exam, with attn to: a. Central and peripheral nervous system; b. Respiratory system; c. Eyes. 3. Urinalysis, as indicator of kidney function. 4. Appropriate liver tests, as DBRP. 5. An electrodiagnostic exam (for those exposed to methyl n-butylketone), including electromyography and nerve conduction velocity measurement. 6. Ability to use negative and positive pressure respirators.	Annually, and as DBRP 1. Same as in A, except 6.	Additional 1. For those with adverse effects from exposure. 2. Appropriate medical management.
Lead (inorganic) (1910.1025, 4/79)	1. For those who are or may be exposed above the action level for more than 30 days/yr. 2. Work history, including past lead exposure at and outside work. 3. Personal or medical history, with attn to: a. Smoking; b. Hygiene and other habits; c. Past gastrointestinal problems; d. Past reproductive problems; e. Past cardiovascular problems; f. Past neurologic problems.	At least annually 1. For those in A.1 who have a blood lead level $\geq 40 \mu\text{g}/100 \text{ g}$ in the past yr. 2. Same as in A.	Additional 1. For those developing signs/symptoms associated with lead intoxication. 2. Same as in A. Additional 3. For those removed from area due to risk of impairment to health, or for those restricted due to a final medical exam. 4. Appropriate medical management.

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Malathion (NIOSH 76-205, 7/76)	1. Comprehensive medical and work histories. 2. Physical exam: a. Frequent headaches, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes. 3. Baseline erythrocyte cholinesterase activity. 4. Ability to use negative or positive pressure respirator.	Annually, or as DBRP 1. Same as in A.1 and 2.	
Manufacture and formulation of pesticides (NIOSH 78-174, 7/78)	1. For those exposed to Groups III, II, and I pesticides (see Reference). 2. Comprehensive work and medical histories, with emphasis on: a. Hepatic system; b. Renal system; c. Central nervous system; d. Glaucoma; e. Cardiovascular disease; f. Respiratory disease; g. Use of drugs; h. Any illness resulting from past exposures. 3. Comprehensive physical exam, with attn to: a. Eyes; b. Liver; c. Kidneys; d. Lungs; e. Central and peripheral nervous system. 4. As DBRP: a. Chest X-ray; b. Liver enzyme determination;	At least annually 1. Same as in A.2 and 3 (see p. 8 of Reference for timing). 2. For those exposed to organic phosphorus. 3. Red blood cell cholinesterase (RBC ChE) activity determination, with method described in Appendix II of Reference or equivalent. 4. If RBC ChE <70% of baseline: a. Advise employee of finding; b. Industrial hygiene survey, unless cause known and correction begun. 5. If RBC ChE <60% of baseline: a. Remove employee from potential exposure and place under medical observation; b. Not allowed back to work with pesticide exposure until RBC ChE ≥75% of baseline.	In an emergency 1. First aid under direction of responsible physician. Additional 2. For those with adverse health due to exposure. 3. Appropriate medical services and surveillance. Within 1 mo after termination of employment 4. Same as in A.

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Manufacture and formulation of pesticides (continued)	c. Urinalysis; d. Pulmonary function. 5. Ability to use negative and positive pressure respirators. 6. If exposed or to be exposed to cholinesterase inhibitors (in Appendix I of Reference), determination of working or pre-exposure baseline for RBC ChE activity (see p. 7 of Reference for further elaboration).		
Mercury (inorganic) (NIOSH 73-11024, 1/73)	1. Look for symptoms such as: a. Loss of weight; b. Sleeplessness; c. Tremors; d. Personality changes; e. CNS involvement.	Annually 1. Same as in A.	
Methyl alcohol (NIOSH 76-148, 3/76)	1. Comprehensive work history. 2. Physical exam, including: a. Ophthalmologic exam.	Annually 1. Same as in A.	
Methyl parathion (NIOSH 77-106, 9/76)	1. Comprehensive medical and work histories. 2. Physical exam, with emphasis on: a. Frequent headaches, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes; b. History of: i. Glaucoma; ii. Cardiovascular disease; iii. Hepatic disease;	Annually, or as DBRP 1. Same as in A.1 and 2.	In an emergency 1. First aid (see Appendix II of Reference). Additional 2. If adverse health effects seen. 3. Appropriate medical services and surveillance.

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α-Naphthylamine (1910.1004, 11/78)	1. Physical exam, with attn to: a. Reduced immuno-competence; b. Steroid or cytotoxic treatments; c. Pregnancy; d. Smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
β-Naphthylamine (1910.1009, 11/78)	1. Physical exam, with attn to: a. Reduced immuno-competence; b. Steroid or cytotoxic treatments; c. Pregnancy; d. Smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
Nickel carbonyl (NIOSH 77-184, no date)	1. Comprehensive medical and work histories, with special emphasis on: a. Lungs; b. Upper respiratory tract. 2. Physical exam. 3. Tests: a. Pulmonary function tests; b. Urinary nickel content; c. 14" x 17" post/ant chest X-ray. 4. Ability to use positive pressure respirator.	At least annually 1. Same as in A. Monthly 2. Samples of urine nickel content.	

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Nickel (inorganic) (NIOSH 77-164, 5/77)	1. Comprehensive medical and work histories, with emphasis on: a. Skin conditions or allergies; b. Illness or sensitizations of upper and lower respiratory system; c. Smoking history. 2. Complete physical exam, with attn to: a. Upper respiratory tract membranes for evidence of bleeding, irritation, ulcers, and perforations; b. Skin, for evidence of dermatitis or irritation. 3. Clinical tests: a. 14" x 17" post/ant chest X-ray; b. Pulmonary function test (FEV1.0, FVC); c. Sputum cytology as DBRP; d. Nickel and protein concentrations in urine; e. Chronic respiratory disease, as assessed by questionnaire. 4. Use of positive or negative pressure respirator.	At least annually 1. Same as in A.1, 2, and 3.	Additional 1. If adverse health effects. 2. Appropriate medical services. In an emergency 3. If contamination of wound by nickel. 4. Prompt and thorough washing of wound.
Nitric acid (NIOSH 76-141, 3/76)	1. Comprehensive work and medical histories. 2. 14" x 17" post/ant chest X-ray. 3. Pulmonary function tests (FVC, FEV1.0 as minimum). 4. Visual exam of teeth for evidence of dental erosion. 5. Use of negative or positive pressure respirator.	Annually, or as DBRP 1. Same as in A. 2. Proper management if exposed.	

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4-Nitrobiphenyl (1910.1003, 11/78)	1. Physical exam, with attn to: a. Reduced immuno-competence; b. Steroid or cytotoxic treatments; c. Pregnancy; d. Smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	At least annually 1. Same as in A.	
Nitroglycerin and Ethylene glycol dinitrate (NIOSH 78-167, 6/78)	1. Comprehensive medical and work histories, with special attn to: a. Disorders of the cardiovascular system. 2. Physical exam, with attn to: a. Cardiovascular system; b. Central and peripheral nervous system; c. Skin. 3. Record: a. Pulse rate; b. BP; c. ECG at rest, during, and after exercise (Master's test). 4. Ability to use positive pressure respirator.	Semi-annually 1. Same as in A.1, 2, and 3. Daily (ideally) 2. Pulse rate.	Additional 1. In event of illness known or suspected to be due to NG or EGDN. 2. Same as in A.2.
N-Nitrosodimethylamine (1910.1016, 11/78)	1. Physical exam, with attn to: a. Reduced immuno-competence; b. Steroid or cytotoxic treatment; c. Pregnancy; d. Smoking.	At least annually 1. Same as in A.	

WORK EXPOSURE (REFERENCE AND DATE)	A. PRE-PLACEMENT REQUIREMENT	B. PERIODIC REQUIREMENTS	C. OTHER REQUIREMENTS
N-Nitrosodimethylamine (continued)	FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Noise (NIOSH 73-11001, 8/72)	2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	Within 30 days of assignment, and every 6 yrs 1. Same as in A. Biennially 1. See pp 1-6 and 7 of Reference for specific levels for testing.	
Organotin compounds (NIOSH 77-115, 11/76)	1. Baseline audiogram, which includes: a. Aural medical history; b. Last exposure to high level noise; c. Number of hours since exposure; d. Type of exposure; e. Noise level, if known. 1. Comprehensive medical and work histories. 2. Complete physical exam, with attn to: a. 14" x 17" post/ant chest X-ray; b. FVC and FEV1.0; c. SGOT, SGPT, and any other tests of hepatic function, as DBRP; d. Eye exam, including tests for: i. Visual acuity; ii. Color vision; iii. Pupillary reactions; iv. Glaucoma; v. Possibility of choked disc; e. ECG (for ≥ 40 yrs old); f. Prior history of increased intracranial pressure; g. If spinal fluid is measured, then perform Queckenstedt maneuver; h. Urinalysis. 3. Ability to use positive or negative pressure respirator.	Annually, or as DBRP 1. Same as in A.1 and 2, with the exception of neurologic exam, as DBRP.	In an emergency 1. Examination to determine need for treatment, with attn to: a. Eyes; b. Lungs. Additional 2. For those with adverse health effects. 3. Appropriate medical services.

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR REC- OMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHER- WISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Oxides of nitrogen (NIOSH 76-149, 3/76)	1. Comprehensive medical and work histories. 2. Pulmonary function tests: a. Auscultation of chest; b. FVC and FEV1.0. 3. Ability to use positive or negative pressure respirator. 4. 14" x 17" post/ant chest X-ray. 5. Other pulmonary function evaluations: a. Pulmonary compliance and diffusion studies.	Annually 1. Same as in A, except A.4.	
Parathion (NIOSH 76-190, 6/78)	1. Comprehensive medical and work histories, to exclude from assignment those with histories of: a. Glaucoma; b. Cardiovascular disease; c. Hepatic disease; d. Renal disease; e. CNS abnormalities. 2. Physical exam, emphasizing: a. Headache, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes. 3. Baseline or working baseline erythrocyte cholinesterase activity. 4. Ability to use positive or negative pressure respirator.	Annually, or as DBRP 1. Same as in A.1 and 2.	In an emergency 1. First aid. Additional 2. In event of associated illness. 3. Appropriate medical services.
Phenol (NIOSH 76-196, 6/76)	1. Comprehensive medical history, with at least the pre-existing disorders of: a. Skin;	As DBRP 1. Same as in A.	In an emergency 1. Prompt first aid.

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Phenol (continued)	b. Respiratory tract; c. Liver; d. Kidneys. 2. Physical exam, with at least: a. Cardiovascular system; b. Respiratory tract; c. Liver; d. Kidneys; e. Skin; f. Blood test; g. Urine exam; h. Other tests, as DBRP. 3. Ability to use negative or positive pressure respirator.		Additional 2. If adverse health effects seen. 3. Appropriate medical services and surveillance.
Phosgene (NIOSH 76-173, 2/76)	1. Comprehensive medical and work histories: a. Pre-existing cardiovascular or pulmonary disorders. 2. Physical exam, with attn to: a. Pulmonary function, including FVC, FEV1.0, and forced midexpiratory flow (FEF 25-75); b. Chest X-ray. 3. Ability to use negative or positive pressure respirator.	Annually, or as DBRP 1. Same as in A.1 and 2, except for A.2.b.	
Polychlorinated biphenyls (NIOSH 77-225, 9/77)	1. Comprehensive medical and work histories, with special emphasis on: a. Hepatic functions; b. Skin condition; c. Reproductive history.	At least annually 1. Same as in A.1 and 2.	Additional 1. At evidence of adverse effects of exposure. 2. Appropriate medical care.

WORK EXPOSURE (REFERENCE AND DATE)	A. PRE-PLACEMENT REQUIREMENT	B. PERIODIC REQUIREMENTS	C. OTHER REQUIREMENTS
Polychlorinated biphenyls (continued)	FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
β-Propiolactone (1910.1013, 11/78)	2. Comprehensive physical exam, with attn to: a. Skin; b. Hepatic functions (SGPT and SGOT activities); c. Serum triglyceride concentration and other indices of fat metabolism, as DBRP. 3. Ability to use positive pressure respirator.	At least annually 1. Same as in A.	
Refined petroleum solvents (NIOSH 77-192, 7/77)	1. Comprehensive medical and work histories. 2. Physical exam, with attn to: a. Skin; b. Liver function tests (e.g., SGOT); c. Complete blood count; d. Urinalysis; e. CNS tests. 3. Ability to use negative or positive pressure respirator.	At least annually 1. Same as in A.1 and 2.	In an emergency 1. First aid, followed by prompt medical evaluation and care. 2. Observation for possibility of central nervous depression.

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR REC- OMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHER- WISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
1,1,2,2-Tetrachloroethane (continued)	c. Nervous system; d. Exposure to other chemicals; e. Episodes of nausea, vomiting, dizziness, headache. 2. Physical exam. 3. Liver function test (SGPT, SGOT). 4. Screening tests of nervous system function, as DBRP. 5. Ability to use positive or negative pressure respirator.		2. Physical exam as in A.2 and any other tests, as DBRP. In an emergency 3. First aid, followed by prompt medical evaluation and care. 4. 24-hr observation for CNS depression.
Tetrachloroethylene (NIOSH 76-185, 7/76)	1. Medical and work histories. 2. Physical exam, with attn to: a. Neurological; b. Cardiovascular; c. Liver function; d. Skin condition. 3. Ability to use positive or negative pressure respirator.	Annually, or as DBRP 1. Same as in A.	Additional 1. If adverse effects from exposure seen. 2. Proper medical management.
o-Tolidine (NIOSH 78-179, 8/73)	1. Comprehensive medical and work histories, with emphasis on: a. Urinary tract. 2. Comprehensive physical exam, including: a. Urinalysis, with microscopic exam; b. Double-check 2.a if proven abnormal, do comprehensive analysis. 3. Ability to use positive pressure respirator.	Annually 1. Same as in A.1 and 2, except 2.a. Quarterly 1. Urinalysis, as in A.2.a.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
1,1,1-Trichloroethane (NIOSH 76-184, 7/76)	1. Medical and work histories. 2. Physical exam, with attn to: a. Neurologic system; b. Cardiovascular system; c. Liver; d. Skin condition. 3. Ability to use positive or negative pressure respirator.	Annually, or as DBRP 1. Same as in A.	
Trichloroethylene (NIOSH 73-11025, 7/73)	1. Comprehensive medical history, with attn to: a. Headache, nausea, and dizziness; b. Complaints and evidence of irritations in: i. Eyes; ii. Mucous membranes; iii. Skin; c. Ophthalmic exam to those complaining of chronic eye irritation. 2. Comprehensive physical exam, emphasizing: a. Cardiac system; b. Pulmonary system; c. Liver; d. Kidneys.	Annually 1. Not specified; presumably, same as in A.	
Tungsten and cemented tungsten carbide (NIOSH 77-227, 9/77)	1. Medical and work histories. 2. Physical exam. 3. Clinical tests, with attn to: a. 14" x 17" post/ant chest X-ray; b. Pulmonary function tests (FVC, FEV1.0). 4. Ability to use positive pressure respirator.	Annually 1. As in A.1,2, and 3.	

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR REC- OMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHER- WISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ultraviolet radiation (NIOSH 73-11009, 12/72)	1. Medical history, with attn to any condition exacerbated or aggravated by exposure to sunlight. 2. Any blemishes appearing on exposed skin when examined by physician.	Not mentioned	
Vanadium (NIOSH 77-222, 8/77)	1. Comprehensive medical and work histories, emphasizing evidence of: a. Chronic eye/skin disorders; b. Respiratory condition; c. Allergies. 2. Physical exam, with attn to: a. Upper respiratory tract; b. Eyes. 3. Clinical tests: a. 14" x 17" post/ant chest X-ray; b. FEV1.0 and FVC, at least. 4. Ability to use negative or positive pressure respirator.	Annually, or as DBRP 1. Same as in A.1, 2, and 3.	
Vinyl acetate (NIOSH 78-205, 9/78)	1. Comprehensive medical and work histories, with attn to pre-existing disorders of: a. Eyes; b. Respiratory system; c. Skin. 2. Physical exam, with attn to: a. Upper respiratory tract; b. Skin; c. Eyes. 3. Ability to use positive pressure respirator.	Annually 1. Same as in A.1 and 2.	

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR REC- OMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHER- WISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Waste anesthetic gases and vapors (continued)	c. Renal system; d. Hematopoietic systems. 2. Physical exam.		
Xylene (NIOSH 75-168, 5/75)	1. Comprehensive medical and work histories, with attn to: a. Incidence of headache, nausea, and other gastrointestinal disturbances; b. Alcohol consumption; c. Dizziness; d. Complaints and evidence of irritation in: i. Eyes; ii. Mucous membranes; iii. Skin. 2. Lab tests: a. Complete blood count; b. Liver function tests; c. Urinalysis.	Biennially 1. Same as in A.	
Zinc oxide (NIOSH 76-104, 10/75)	1. Comprehensive work and medical histories. 2. Physical exam, with emphasis on: a. Respiratory tract, as DBRP; b. Chest X-ray, as DBRP; c. Pulmonary function, as DBRP.	As DBRP 1. Appropriate emergency care.	

SUMMARY CHART

OSHA MEDICAL SURVEILLANCE REQUIREMENTS AND NIOSH RECOMMENDATIONS

**For Employees Exposed to Toxic Substances
and Other Work Hazards**

Prepared by

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for

**The NASA Occupational Health Office
National Aeronautics and Space Administration
Washington, D.C. 20546**

January 1980

WORKER EXPOSURE	TIMING PRE = PREEMPLOYMENT ANN = ANNUALLY NS = NOT SPECIFIED	HISTORIES		LABORATORY TESTS																OTHERS (SPECIFY)
		WORK EXPOSURE	MEDICAL/ PERSONAL	FAMILY	PHYSICAL EXAM		X-RAY	PULMONARY FUNCTION (FVC, FEV1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD/URINE TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP		
11/78 Acetylaminofluorene	PRE				X	X	X	X												
	ANN				X	X	X	X												
7/76 Acetylene	PRE				X	X		X												
	NS				X	X		X												
10/76 Acrylamide	PRE				X	X		X												
	ANN or as DBRP				X	X		X												
10/78 Acrylonitrile	PRE*				X	X		X	P-A										X	Intestinal tract for ≥ 40, as DBRP
	ANN*				X	X		X	P-A										X	
3/77 Alkanes	PRE				X	X		X												
	ANN				X	X		X												
9/76 Allyl chloride	PRE				X	X		X	Chest	X	X	X			X		X			
	ANN				X	X					X			X		X				
11/78 4-Aminodiphenyl	PRE				X	X	X	X												
	ANN				X	X	X	X												
7/74 Ammonia	PRE							X		X										
	NS																			
9/78 Antimony	PRE				X	X		X	P-A	X						X				
	ANN				X	X		X	P-A	X						X				
7/78 Arsenic (inorganic)	PRE*				X	X		X	P-A								X		X	
	ANN<45* SEMI-ANN>45				X	X		X	P-A								X		X	
11/78 Asbestos	PRE†					X		X	P-A	X										
	ANN†					X		X	P-A	X										
10/78 Asphalt fumes	PRE				X	X		X												
	As DBRP				X	X		X												

*For those exposed to substance at or above action level

†For those exposed to airborne concentrations

WORKER EXPOSURE	TIMING PRE = PRE-EMPLOYMENT ANN = ANNUALLY NS = NOT SPECIFIED	HISTORIES		LABORATORY TESTS														OTHERS (SPECIFY)
		WORK EXPOSURE	MEDICAL/ PERSONAL	PHYSICAL EXAM	FAMILY	X-RAY	PULMONARY FUNCTION (FVC, FEV1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP	
4/79	PRE*	X	X	X		As DBRP					X							X
Benzene	SEMI-ANN*	X	X			As DBRP					X							X
11/78	PRE	X	X	X		X												
Benzidine	ANN	X	X	X		X												
6/77	PRE	X	X			X												
Benzoyl peroxide	TRIENN or as DBRP	X	X			X												
8/78	PRE	X	X			X	P-A	X										
Benzyl chloride	ANN	X	X			X		X										
6/72	PRE					X	Chest	X										
Beryllium	ANN		X			X	Chest	X										
12/76	PRE	X	X			X	As DBRP	X										
Boron trifluoride	ANN	X	X			X	As DBRP	X										
8/76	PRE	X	X			X	P-A	X	X	X	X	X	X	X		X		BP
Cadmium	ANN or as DBRP	X	X			X	As DBRP	X		X	X	X	X	X				BP; palpation of male prostate if > 40 yrs old
9/76	PRE	X	X			X						X		X		X		
Carbaryl	ANN or as DBRP	X	X			X							X		X			
9/78	PRE	X	X			X	P-A, Lat As spec'd	X						X			X	
Carbon black	ANN	X	X			X		X						X			X	
8/76	PRE	X	X			X												
Carbon dioxide	As DBRP	X	X			X												
5/77	PRE	X	X			X							X	X				
Carbon disulfide	ANN	X	X			X							X	X				
8/72	PRE					X												
Carbon monoxide	NS					X												

*For those exposed to substance at or above action level and those subjected to an emergency

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	TIMING PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	HISTORIES		LABORATORY TESTS															OTHERS (SPECIFY)
		WORK EXPOSURE	MEDICAL/ PERSONAL	FAMILY	PHYSICAL EXAM		X-RAY	PULMONARY FUNCTION (FVC, FEV 1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD/URINE TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP	
6/76 Carbon tetrachloride	PRE	X	X		X			X											Vision
	ANN or as DBRP	X	X		X			X											
5/76 Chlorine	PRE	X	X		X	P-A													
	ANN or as DBRP																		
12/74 Chloroform	PRE	X	X		X			X					X	X					
	ANN or as DBRP	X	X		X			X					X	X					
11/78 bis-Chloromethyl ether	PRE	X	X	X	X														
	ANN	X	X	X	X														
8/77 Chloroprene	PRE	X	X		X	P-A	X	X					X	X				X	
	ANN or as DBRP	X	X		X	P-A	X	X					X	X				X	
7/73 Chromic acid	PRE	X	X		X	P-A													
	ANN	X	X		X	As spec'd													
12/75 Chromium (VI)	PRE	X	X		X	P-A		As DBRP					X				As DBRP		
	ANN	X	X		X	P-A		As DBRP					X				As DBRP		
9/78 Coal gasification	PRE	X	X		X	P-A	X	X		As DBRP			X	X	X	X			Audiometric to those exposed to noise
	ANN	X	X		Bi- ennial	Bi- ennial													
9/77 Coal tar products	PRE	X	X		X	P-A, Lat	X	As DBRP					As DBRP				X		
	ANN	X	X		X	P-A, Lat	X	As DBRP					As DBRP				X		
5/78 Coke oven emissions	PRE*	X	X		X	P-A	X						X		X	X			
	ANN < 45 SEMI-ANN†	X	X		X	P-A	X						X		X	X			
1/79 Cotton dust	PRE	X	X		X		X												Standardized questionnaire
	ANN or SEMI-ANN	X	X		X		X												
8/79 Cotton dust in cotton gin	PRE	X	X		X		X												Standardized questionnaire; detailed pulmonary if FEV < 60% of predicted value
	ANN	X	X		X		X												

*For those in regulated area 30 days/yr

†For those > 45 yrs old or with > 5 yrs employment in regulated area

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	TIMING PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	HISTORIES		LABORATORY TESTS														OTHERS (SPECIFY)
		WORK EXPOSURE	MEDICAL/ PERSONAL	PHYSICAL EXAM FAMILY	X-RAY	PULMONARY FUNCTION (FEV1, FEV1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP		
2/78 Cresol	PRE	X	X		X			X	X			X		X				Kidney function
	ANN	X	X		X			X	X			X		X				
11/74 Crystalline silica	PRE	X	X		X	P-A	X											
	TRIENN	X	X		X	P-A												
7/78 1,2-Dibromo-3-chloropropane	PRE	X	X		X						X						X	Sperm count
	ANN	X	X		X					X							X	
11/78 3,3-Dichlorobenzidine	PRE	X	X	X	X													
	ANN	X	X	X	X													
11/78 4-Dimethylaminobenzene	PRE	X	X	X	X													
	ANN	X	X	X	X													
2/78 Dinitro-ortho-cresol	PRE	X	X		X			X	X			X		X				Kidney function
	ANN	X	X		X			X	X			X		X				
9/77 Dioxane	PRE	X	X		X			X				X						Kidney function
	ANN	X	X		X			X				X						
76 Emergency egress	PRE	X	X		X													Eye; hearing; manual dexterity, speed of reaction
	ANN or AS DBRP	X	X		X													
9/76 Epichlorohydrin	PRE	X	X		X			As DBRP		As DBRP								
	ANN	X	X		X			As DBRP		As DBRP								
8/77 Ethylene dibromide	PRE	X	X		X													
	ANN or AS DBRP	X	X		X													
9/78 Ethylene dichloride	PRE	X	X		X													
	ANN	X	X		X													
11/78 Ethyleneimine	PRE	X	X	X	X													
	ANN	X	X	X	X													

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	HISTORIES		LABORATORY TESTS														OTHERS (SPECIFY)
	PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	PHYSICAL EXAM FAMILY MEDICAL/PERSONAL WORK EXPOSURE TIMING	PHYSICAL EXAM X-RAY PULMONARY FUNCTION (FVC, FEV 1.0) LIVER FUNCTION (SGOT, SGPT) HEMATOLOGY CHEMISTRY BLOOD/URINE TRACE METALS URINALYSIS ECG URINE CYTOLOGY SPUTUM CYTOLOGY OTHER AS DBRP OTHERS	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	PHYSICAL EXAM	
8/77 Ethylene oxide	PRE	X	X		X				X								
	ANN or AS DBRP	X	X		X												
9/77 Fibrous glass	PRE	X	X		X	As spec'd	As DBRP									Eye exam	Tests for dermatophagism
	ANN or AS DBRP	X	X		X	As spec'd	As DBRP									Eye exam	
6/75 Fluorides (inorganic)	PRE				X						X	X					Male periodic radiologic exam every 6 years
	BIENN				X						X	X					
9/77 Decomposition products of Fluorocarbon polymers	PRE	X	X		X												
	As DBRP																
12/76 Formaldehyde	PRE	X	X														
	Not mentioned																
6/78 Glycidyl ethers	PRE	X	X		X	As DBRP	As DBRP		As DBRP								Tests of manual dexterity and visual-motor coupling
	As DBRP	X	X		X	X	X		X								
6/72 Hot environments	PRE		X		X												
	BIENN ≤ 45 ANN > 45		X		X												
6/78 Hydrazines	PRE	X	X		X	P-A		X	X			X				U; Sb*	
	ANN	X	X		X	P-A		X	X			X				U; Sb*	
10/76 Hydrogen cyanide	PRE	X	X		X												
	ANN	X	X														
3/76 Hydrogen fluoride	PRE	X	X		X	Male pelvis	X				X	X					
	NS					As DBRP	As DBRP										
5/77 Hydrogen sulfide	PRE	X	X		X												
	TRIENN†	X	X		X												
4/78 Hydroquinone	PRE	X	X		X												Slitlamp exam
	ANN	X	X		X												Ophthalmic exam

*U = Urobilinogen; Sb = Serum bilirubin

† For those exposed to substance above ceiling limit

WORKER EXPOSURE	TIMING PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	HISTORIES		LABORATORY TESTS																
		WORK EXPOSURE	MEDICAL/ PERSONAL	PHYSICAL FAMILY	PHYSICAL EXAM														OTHERS (SPECIFY)	
					X-RAY	PULMONARY FUNCTION (FVC, FEV 1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP				
3/76 Isopropyl alcohol	PRE	X	X			As DBRP												L&B*		
	ANN	X	X			As DBRP												L&B*		
1/76 Kepone	PRE	X	X		X			As DBRP												
	ANN	X	X		X			As DBRP												
10/78 Ketone	PRE	X	X		X			As DBRP					X					Electronmyography; nerve conduction velocity		
	ANN & as DBRP	X	X		X			As DBRP					X							
4/79 Lead	PRE†	X	X		X					X	X	X	X		X		X	BP		
	ANN††	X	X		X					X	X	X	X		X		X			
7/76 Logging	PRE		X		X															
	BIENN < 40 ANN ≥ 40		X		X															
7/76 Malathion	PRE	X	X		X						X									
	ANN	X	X		X															
7/78 Manufacture and formulation of pesticides	PRE	X	X		X	As DBRP	As DBRP	As DBRP		As spec'd		As DBRP								
	ANN	X	X		X	As DBRP	As DBRP	As DBRP		As spec'd		As DBRP								
1/73 Mercury (inorganic)	PRE				X															
	ANN				X															
3/76 Methyl alcohol	PRE	X			X													Ophthalmologic exam		
	ANN	X			X															
9/76 Methyl parathion	PRE	X	X		X						As spec'd									
	ANN or as DBRP	X	X		X															
3/76 Methylene chloride	PRE	X	X		X					X								Autonomic function		
	ANN or as DBRP	X	X		X					X										
11/78 4-Methylene bis	PRE	X	X	X	X															
	ANN	X	X	X	X															

*L&B = Laryngoscopy and bronchoscopy

†For those exposed above action level more than 30 days/yr

††For those exposed above action level more than 30 days/yr, with blood level at or above 40mg/100g

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	HISTORIES		LABORATORY TESTS														OTHERS (SPECIFY)
		WORK EXPOSURE	MEDICAL/ PERSONAL	PHYSICAL FAMILY	PHYSICAL EXAM	X-RAY	PULMONARY FUNCTION (FVC, FEV 1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP	
11/78 α Naphthylamine	PRE		X	X	X	X												
	ANN		X	X	X	X												
11/78 β Naphthylamine	PRE		X	X	X	X												
	ANN		X	X	X	X												
(No date) Nickel carbonyl	PRE		X	X		X	P-A	X					X					
	ANN		X	X		X	P-A	X					MS*					
5/77 Nickel (inorganic)	PRE		X	X		X	P-A	X					X	X			As DBRP	
	ANN		X	X		X	P-A	X					X	X			As DBRP	
3/76 Nitric acid	PRE		X	X		X	P-A	X										Teeth
	ANN or as DBRP		X	X		X	P-A	X										
11/78 4-Nitrobiphenyl	PRE		X	X	X	X												
	ANN		X	X	X	X												
6/78 Nitroglycerin and Ethylene glycol dinitrate	PRE		X	X		X									Master's Master's			Pulse rate, BP
	SEMI-ANN		X	X		X												
11/78 N-Nitrosodimethylamine	PRE		X	X	X	X												
	ANN		X	X	X	X												
8/72 Noise	PRE																	Audiogram
	BIENN																	
11/76 Organotin compounds	PRE		X	X		X	P-A	X	X					X	40+			Eye exam
	ANN or as DBRP		X	X		X	P-A	X	X					X	40+			
3/76 Oxides of nitrogen	PRE		X	X		X	P-A	X										
	ANN		X	X		X		X										
6/78 Parathion	PRE		X	X		X						X						
	ANN or as DBRP		X	X		X												

*MS = Monthly sampling

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	PRE - PRE-EMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	HISTORIES		LABORATORY TESTS														OTHERS (SPECIFY)	
		TIMING	WORK EXPOSURE	MEDICAL/ PERSONAL	PHYSICAL FAMILY	PHYSICAL EXAM	X-RAY	PULMONARY FUNCTION (FEV1, FEV1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	BLOOD CHEMISTRY	BLOOD/URINE TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY		OTHERS AS DBRP
6/76 Phenol	PRE	X	X		X				X			X						X	
	As DBRP	X	X		X				X			X						X	
2/76 Phosgene	PRE	X	X		X	Chest	X												
	ANN or as DBRP	X	X		X		X												
9/77 Polychlorinated biphenyls	PRE	X	X		X			X			As DBRP								
	ANN	X	X		X			X			As DBRP								
11/78 β-Propiolactone	PRE	X	X	X	X														
	ANN	X	X	X	X														
7/77 Refined petroleum solvents	PRE	X	X		X			X					X						CNS tests
	ANN	X	X		X			X					X						
9/75 Sodium hydroxide	PRE				X														
	Not ment'd																		
6/74 Sulfuric acid	PRE				X														Teeth
	ANN				X														
2/74 Sulfur dioxide	PRE				X														
	ANN				X														
12/76 1,1,2,2-Tetrachloroethane	PRE	X	X		X			X										NSF*	
	ANN	X	X		X			X										NSF*	
7/76 Tetrachloroethylene	PRE	X	X		X			X											
	ANN	X	X		X			X											
8/78 o-Tolidine	PRE	X	X		X								X		X				
	ANN	X	X		X								X		X				
7/73 Toluene	PRE				X				X				X						
	BIENN				X				X				X						

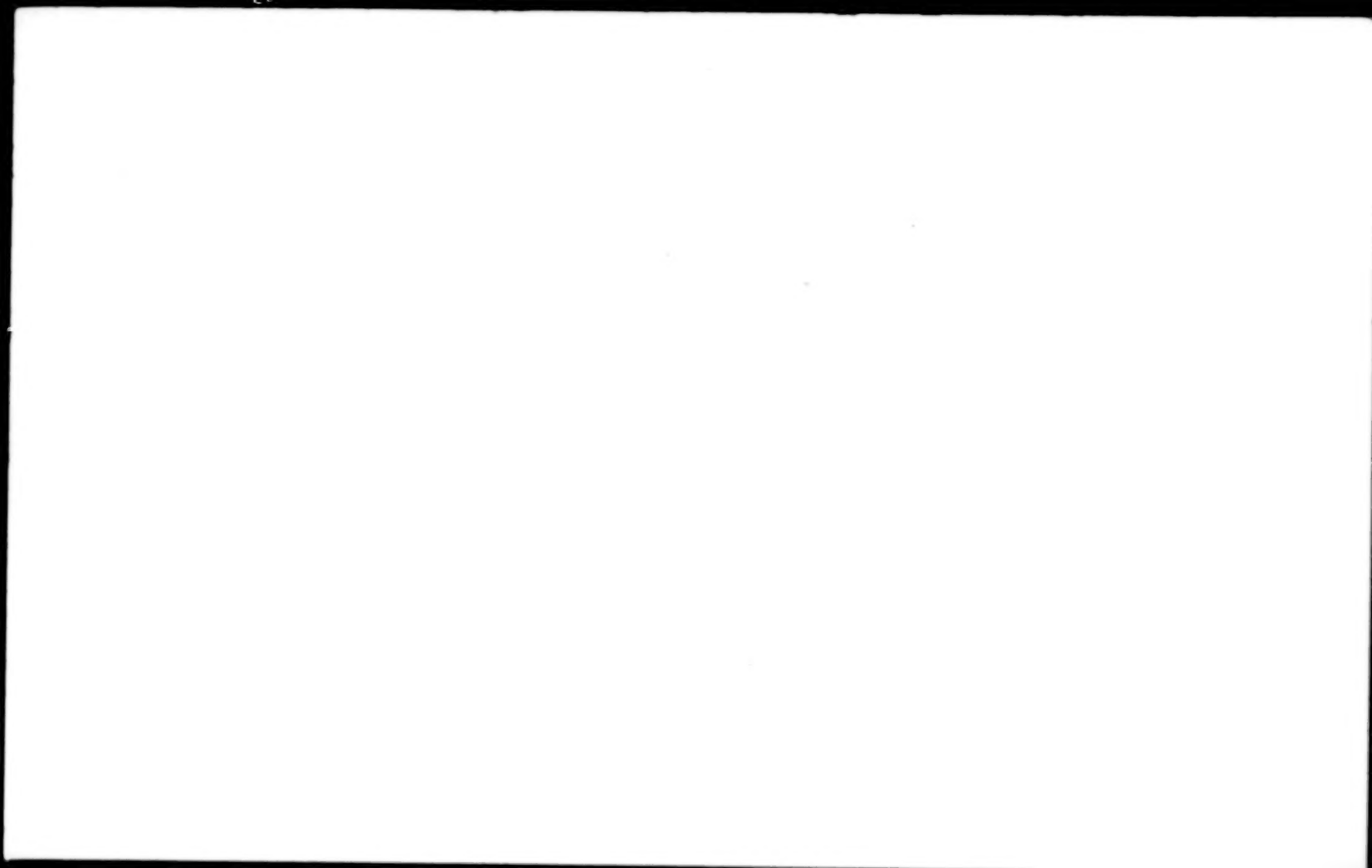
*NSF = Screening tests of nervous system function

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

WORKER EXPOSURE	HISTORIES		LABORATORY TESTS																
	TIMING PRE - PREEMPLOYMENT ANN - ANNUALLY NS - NOT SPECIFIED	WORK EXPOSURE	MEDICAL/ PERSONAL FAMILY	PHYSICAL EXAM	X-RAY	PULMONARY FUNCTION (FVC, FEV 1.0)	LIVER FUNCTION (SGOT, SGPT)	HEMATOLOGY	CHEMISTRY	BLOOD/URINE TRACE METALS	URINALYSIS	ECG	URINE CYTOLOGY	SPUTUM CYTOLOGY	OTHER CYTOLOGY	OTHERS AS DBRP			OTHERS (SPECIFY)
7/73 Toluene diisocyanate	PRE			X		X	P-A	X		X									
	ANN			X		X		X		X									
7/76 1,1,1-Trichloroethene (methyl chloroform)	PRE		X	X		X													
	ANN		X	X		X													
7/73 Trichloroethylene	PRE			X		X													Ophthalmic exam to those complaining of eye irritation
	ANN			X		X													
9/77 Tungsten and Cemented tungsten carbide	PRE		X	X		X	P-A	X											
	ANN		X	X		X	P-A	X											
12/72 UV Radiation	PRE			X		X													
	Not mentioned																		
8/77 Vanadium	PRE		X	X		X	P-A	X											
	ANN		X	X		X	P-A	X											
9/78 Vinyl acetate	PRE		X	X		X													
	ANN		X	X		X													
11/78 Vinyl chloride	PRE		X	X		X	P-A	X	X		X		X						
	SEMI-ANN*		X	X		X	P-A	X	X		X		X						
3/77 Waste anesthetic gases and vapors	PRE		X	X		X													
	ANN					X													
5/73 Xylene	PRE		X	X		X			X	X			X						
	BIENN		X	X		X			X	X			X						
10/75 Zinc oxide	PRE		X	X		X	As DBRP	As DBRP											
	As DBRP		X	X		X	As DBRP	As DBRP											

*For those with > 10 yrs exposure; ANN for others

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN



END

3-2-82